

## CLAIMS

1. An electro-chemical sensor comprising  
at least two redox systems sensitive to the same species.  
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2. The sensor of claim 1 wherein the species are protons.
3. The sensor of claim 1 wherein the at least two redox systems  
have a maximum or peak redox reaction at different voltages.  
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4. The sensor of claim 1 wherein the at least two redox systems  
are mounted onto the same conductive substrate.
5. The sensor of claim 4 wherein the at least two redox systems  
15 are mounted onto a carbon-based substrate.
6. The sensor of claim 5 wherein the at least two redox systems  
are mounted onto a carbon powder substrate.
- 20 7. The sensor of claim 5 wherein the at least two redox systems  
are mounted onto a diamond-based substrate.
8. The sensor of claim 7 wherein the at least two redox systems  
are mounted onto a multi-walled nanotube-based substrate.  
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9. The sensor of claim 1 comprising a detector adapted to  
measure the redox potential of said at least two redox  
system in the presence of the species and to convert  
measurements into an signal indicative of the concentration  
30 of said species.
10. An electro-chemical sensor for determining the concentration  
of a molecular species in a fluid comprising a first  
redox system sensitive to said species and a second  
35 redox system sensitive to said species;  
voltage supply and electric current detector to perform  
voltammogramic measurements;

and an analyser to detect relative shifts in said  
voltammogrammic measurements.

11. A downhole tool for measuring characteristic parameters of  
5 wellbore effluents comprising an electro-chemical sensor in  
accordance with claim 1.
12. A downhole formation sampling tool for measuring  
characteristic parameters of wellbore effluents comprising  
10 an electro-chemical sensor in accordance with claim 1.
13. A downhole tool for measuring characteristic parameters of  
wellbore effluents comprising an electro-chemical sensor in  
accordance with claim 1 mounted onto a permanently installed  
15 part of the wellbore.